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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/393,768	09/10/1999	EROL BASTURK	239603PL-011	3272

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EXAMINER

FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
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2663

DATE MAILED: 03/22/2004

15

Please find below and/or attached an Office communication concerning this application or proceeding.

ppg

Office Action Summary

Application No.

09/393,768

Applicant(s)

BASTURK ET AL.

Examiner

Derrick W. Ferris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 9-11, 15-18, 21, 23 and 25-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-11, 15-18, 21, 23 and 25-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. **Claims 1-4, 9-11, 15-18, 21, 23, and 25-34** as amended are still in consideration for this application. Applicant has amended claims 1, 9, 15, 18, 21, 23, and 25. Applicant has canceled claims 12-14. Please note that applicant's submission of the amended claims canceled claims 12-14, however, applicant's remarks still address these claims (see applicant's remarks filed 2/26/04 on page 8, first paragraph). Examiner assumes claims 12-14 are rejected per the claim amendment sheets.

2. Examiner does **not withdraw** the obviousness rejection to *Hsu* in view of *Viswanathan* and in further view of *Wilford* for Office action filed 12/11/03. In addressing applicant's arguments in the response filed 02/26/04, applicant states the following three limitations:

“accessing a tag as well as the directed graph-index for determining the successor node”,

“the routing bias table is selected from a plurality of routing bias tables indexed by the first node and the directed-graph index”, and

“a directed-graph index arrives with the packet for accessing at the first node”.

In addressing these limitations applicant only focuses on the *Wilford* reference. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As such, examiner notes the above-mentioned limitations are taught by the base reference used in the rejection *Hsu*. Applicant is silent in addressing the *Hsu* reference in their remarks. In particular, see e.g., column 5, lines 25-67 with respect to figure 3

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of *Hsu*. Specifically figure 3 of *Hsu* shows using directed graphs for MPLS flows. Although the structure of the received packets are not specifically disclosed by *Hsu*, implicit from the reference are packets containing an MPLS label and a directed graph index since each packet is routed using MPLS and a directed graph (see e.g., column 2, line 66 – column 3, line 10; column 5, lines 13-23; and column 6, lines 11-14). Also shown in figure 3 is routing from source to destination with respect to determining a successor node. Furthermore, as routing is preformed at each router in the network each packet must have a label and a directed index graph where applicant further recites modifying or updating the label/tag (e.g., see step 1 in comparison to step 9 in applicant's figure 1). For modifying or updating the label/tag the examiner relies on both *Viswanathan* and *Wilford*. See clarified rejection below for independent claims 1 and 18.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4, 9-11, 15-18, 21, 23, and 25-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,363,319 B1 to *Hsu* in view of "Evolution of Multiprotocol Label Switching" to *Viswanathan et al.* ("*Viswanathan*") and in further view of U.S. Patent No. 6,512,766 B2 to *Wilford*.

As to **claims 1, 18, 21 and 23**, *Hsu* discloses a method and apparatus for selecting a route for a flow from a plurality of network paths connecting a source to a destination

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[Abstract]. More specifically, *Hsu* discloses constraint-based route selection using biased cost. Shown in figure 1a are routers using a centralized biased cost route selector (BCRS) and shown in figure 2 are routers using a distributed biased cost route selector (BCRS) using label edge routers (LERs) [column 3, lines 32-38]. With respect to a first and second node, examiner notes figure 3 illustrating a directed graph index [column 5, lines 25-67; column 6, lines 1-8]. Examiner notes that MPLS is known in the art for packet forwarding [column 1, lines 15-16]. *Hsu* also discloses using a loop free algorithm (i.e., acyclic as defined by applicant on page 5, lines 3-4).

The *Hsu* reference is generally silent or deficient to the limitation of replacing the tag (i.e., MPLS label) of the packet with the updated tag to give an updated packet. Examiner notes that it would have been obvious to a skilled artisan to replace the tag (i.e., MPLS label) when routing/switching the packet in the MPLS network. Examiner notes that further support or motivation comes from *Viswanathan* which discloses that a packet is “labeled” by either encoding the label in the data link layer or network layer header, or encapsulating the packet with a header specifically for MPLS [page 167, bottom right-hand column]. Thus *Viswanathan* cures the above-cited deficiency by disclosing replacing the tag of the packet with an updated tag for MPLS. The examiner proposes to modify the *Hsu* reference to include updating the MPLS tag since by updating the tag the router is able to route a packet dynamically. *Hsu* provides such a motivation found at column 2, lines 50-57. Further, examiner notes a reasonable expectation level of success since each router checks the routing table such that if packet’s label is changed some

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where in the network the next router will still be able to handle the packet with the updated MPLS tag.

In addition, *Hsu* and *Viswanathan* may be silent or deficient to using a normalizing function to the tag where the normalizing function enhances network performance by reducing the number of bits involved in accessing the routing table bias table. Examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to use a normalizing function to the tag where the normalizing function enhances network performance by reducing the number of bits involved in accessing the routing table bias table. In particular, examiner purposes modifying the *Hsu* reference to include a hash of the MPLS label/tag (i.e., a normalized label/tag) instead of using the actual label/tag. One skilled in the art would have been motivated to reduce the number of bits in a tag to both save space as well as speed up computations since less bits are used to represent the tag via a hash key. In addition, one skilled in the art would be motivated to use a hashing function to reduce/normalize the number of bits involved in accessing the routing table bias table since a hash reduces the overall number of bits needed to lookup a route in a routing table. As such, *Wilford* cures the above-cited deficiency by disclosing in figure 2, step 226 that the routing table lookup involves generating a hash key (i.e., normalized Tag T_N) from the routing information (i.e., Tag T) and using the hash key (i.e., normalized Tag T_N) to index to routing table lookups [column 5, lines 44-50]. Thus *Wilford* discloses using a hash key where by definition a hash (coding) reduces the number of bits involved in access routing information. Examiner notes a further reasonable expectation level of success since *Hsu* teaches using

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a direct graph with a label such that any label (either the actual label or a hash) would work without departing from the spirit and scope of the invention.

As to **claim 2**, both references disclose transporting the packet to a destination node, using a reasonable but broad interpretation, where applicant defines destination node as either a terminal or a router on page 8, lines 10-11 of applicant's specification. For example, as shown in figure 2 of *Viswanathan* and on page 168 bottom right-hand column.

As to **claim 3**, *Hsu* discloses routing an MPLS packet in general over a directed graph network. Again, *Hsu* is deficient or silent to how a label is changed at an intermediate node. Examiner notes that it would have been obvious to a skilled artisan prior to applicant's invention to change a label at an intermediate node. Again, *Viswanathan* provides additional support by disclosing that a label can be swapped at intermediate (i.e., subsequent) nodes [page 167, bottom right-hand column].

As to **claim 4**, see the same reasoning behind the rejection to claim 2.

As to **claim 33**, see the same reasoning behind the rejection for claim 1 (and as shown in figure 3 of *Hsu*).

As to **claims 9 and 25**, both reference disclose using an updating function throughout the network.

As to **claims 10-11 and 26-27**, examiner notes using a reasonable but broad interpretation of "randomizing", the limitation is also by *Hsu*. *Hsu* teaches a constraint-based route selection technique that supports establishing Multi-protocol Label Switching (MPLS) label switched paths through explicit routing [column 2, lines 66-67; column 3,

lines 1-2]. Examiner notes that although explicit routing is disclosed, hop-by-hop routing is further supported [column 6, lines 37-44]. In particular, *Hsu* discloses a randomizing function with respect to load balancing [column 12, lines 31-40; column 13, lines 4-22]. Specifically that the multi-class technique attempts to offer a greater diversification on the multi-paths [column 13, lines 20-22].

As to **claim 28**, see the rejection for claim 9.

As to **claims 29-30**, see the rejection for claims 10-11.

As to **claims 15-16 and 31-32**, *Viswanathan* discloses the general concept of using a general packet between source and destination which may occur between one or more intermediate nodes. *Hsu* provides additional support by disclosing a flow of a packet (i.e. FIFO packet flow).

As to **claims 17 and 34**, *Viswanathan* discloses matching variable bits for a label using a broad but reasonable interpretation of hash.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DWF

Derrick W. Ferris
Examiner
Art Unit 2663



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TECHNOLOGY CENTER 2600 3/18/04